Rhode Island Quality Institute

ED Smart Notifications Technical Design

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Version 1.3.2

Date: 9/6/201810/11/2018

Project: EDSN

DOC ID:

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Adam Trahan - RIQI

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Figures

Revision History

Version	Revision Date	Implemented By	Reason
1.0	7/12/18	P. Carignan J2	Initial Creation (High-level)
1.1	7/17/18	P. Carignan J2	Changes per Adam's review.
1.2	7/17/18	P. Carignan J2	Changes per Adam's review.
1.3	8/30/18	Adam Trahan	Changes from Meeting with Melissa and Amy (see external comment log)
1.3.1	9/4/18	Adam Trahan	Minor text changes (see external comment log)

Version	Revision Date	Implemented By	Reason
1.3.2	9/6/18	Adam Trahan	Additional field "NotSentReason" added to audit
1.4	10/11/18	Adam Trahan	Removed Hasbro filtering and EDSN dynamic panel

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Document Review & Stakeholders

Organization	Name	Role
Office of Health and Human Services (OHHS)	Amy Zimmerman, MPH	Principal Policy Associate
Office of Health and Human Services (OHHS)	Melissa Lauer, MPA	HIT Specialist
RIQI	Elaine Fontaine	Business Owner

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Project Contacts

Organization	Responsibilities	Contact(s)
RIQI – Business Owner	Represents Sponsor of the program organization and is ultimately responsible for foreseeing that the program meets its overall objectives. Empowered to make decisions on behalf of the sponsor.	Elaine Fontaine, EFontaine@riqi.org
RIQI – Project Manager	Responsibility for the successful initiation, planning, design, execution, monitoring, controlling and closure of a project.	April Arnold, AArnold@riqi.org
RIQI – Analyst	Responsible for defining needs and recommending solutions that deliver value to stakeholders. Gather and document needs and the rationale for change, and to design and describe solutions that deliver value.	Andrea Levesque, ALevesque@riqi.org

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Related Documentation

ID	Title	Version	Notes
Business Requirements	RIQI - ED Smart Notifications - Business Requirements v6.3_7.12.18	6.3	
Solution Architecture	EDSN Solution Architecture	1.0	
Epic	Incoming Transcriptions Interface Technical Specifications		February 17,2018

1. Logical Architecture
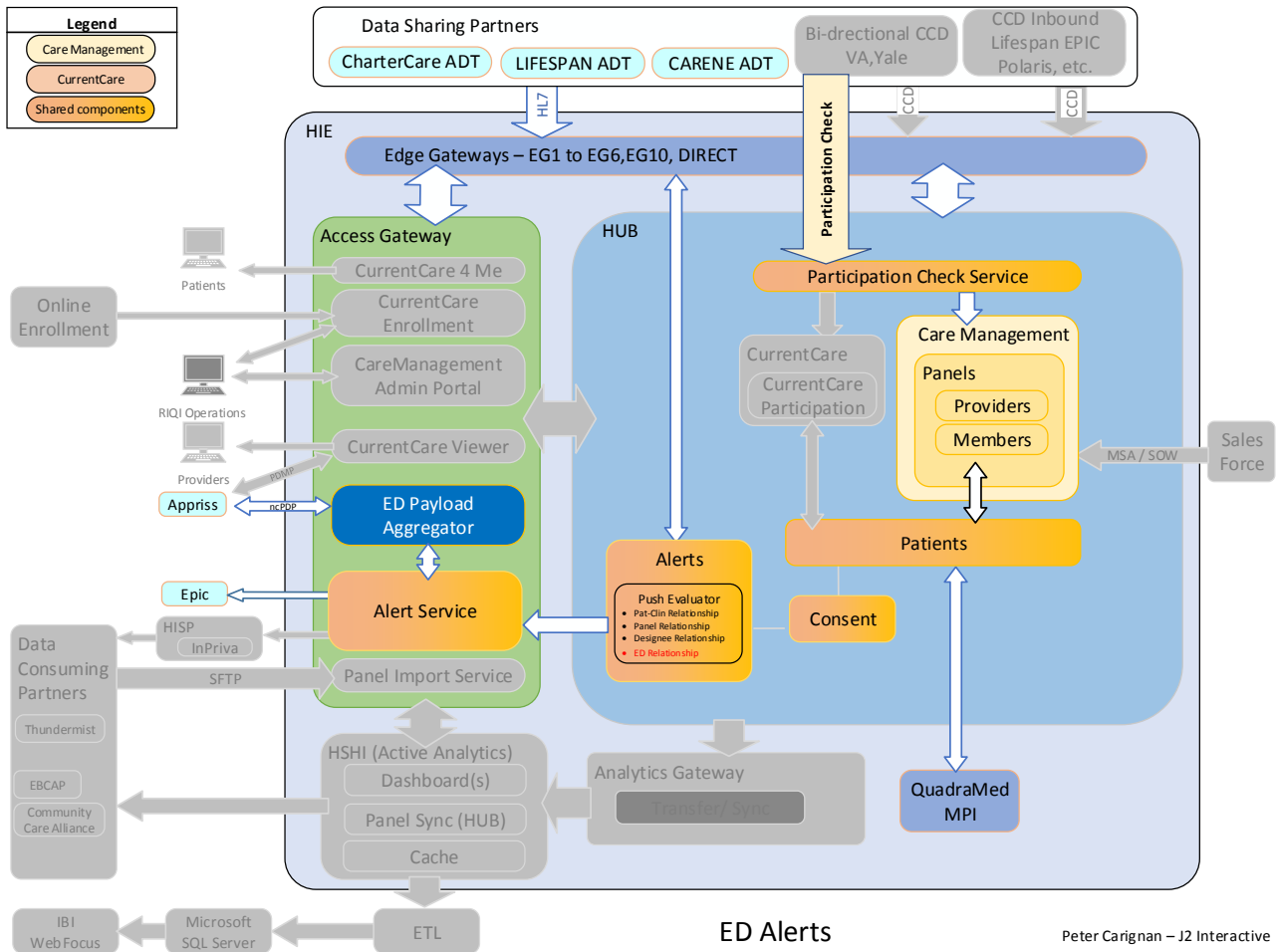
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34 **Figure 1: Logical Architecture Diagram**

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2. Sequence Diagrams
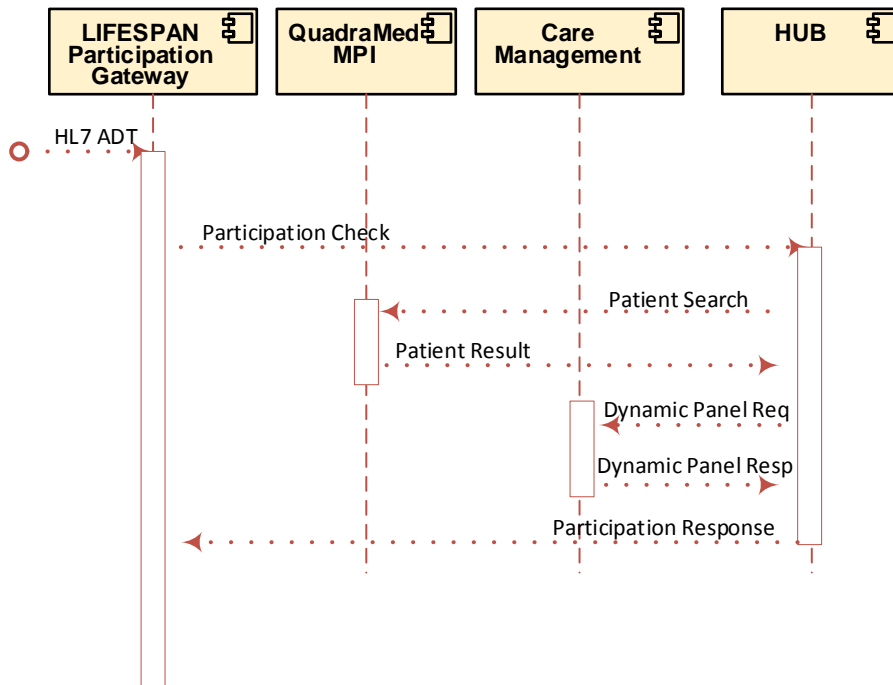
2.1 RIQI Stores All ADTs

Figure 2: HL7 ADT Storage Diagram

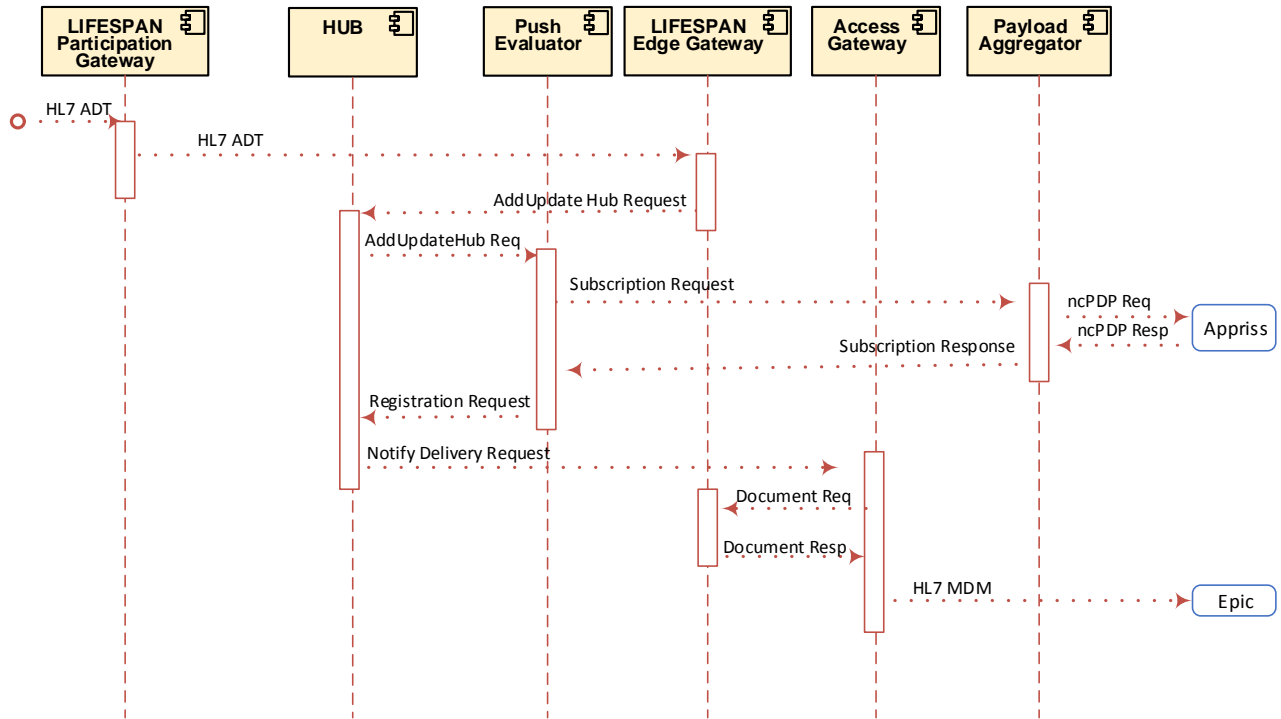## 2.2 RIQI Sends Risk Level(s) & HIE Data

Figure 3: Risk MDM Diagram

48 **3. Class Diagram**

49 **3.1 Custom Audit Class**

50   A new audit table will be created for logging Push Notifications specific to EDSN.

Custom.RIQI.Class.HS.Audit.EDSN		
LastName	String	Max=128
FirstName	String	Max=128
MPIID	Integer	
ExternalInfoRequested	String	"Yes", "No"
ExternalInfoRequestedOn	DateTime	
ExternalInfoResponse	String	"Yes","No Response","No Data"
ExternalInfoRespondedOn	DateTime	
PushNotificationSentOn	DateTime	
OpioidRiskScore	Integer	
OpioidRiskScoreCalculatedOn	DateTime	
NotSentReason	String	"Not Enough Data to Evaluate Risk" "Ambiguous Patient Match" "Risk is Not High/No ED Visits" "Other Reason"

51

52 NotSentReason will need to be defined whenever a record is evaluated for EDSN, but does not ultimately
53 trigger a notification. Additionally, logic will need to be added to capture when an otherwise triggering
54 event is not evaluated because the patient match was ambiguous. This field will be used in reporting to
55 count totals for each reason.

56 Note: Logging related to individual user disclosure will be maintained in the alert recipient's EMR
57 (Lifespan/Epic). RIQI will only be responsible for auditing of the transmission of the ED Smart Notification to
58 the EMR.

59 **4. Resources to be Added or Modified**

Class	Description
Custom.RIQI.Class.EDSN.PayloadAggregator	New operation to gather external information from Appriss. Other data housed internal to RIQI such as diagnoses and visit history will continue to be available from the existing access gateway aggregation process.
Custom.RIQI.Class.HS.Audit.EDSN	New Audit class to track EDSN notifications.

60

61

5. Technical Specification

5.1 EDSN Platform Specifications

When a high risk patient is identified, an HL7 v2 MDM message, as prescribed in the Epic Transcription Interface specification, will be generated and sent back to Epic. No notifications will be sent for patients with insufficient risk results, or non-high risk patients.

5.1.1   Creation of EDSN Dynamic Panel

Initial setup of the EDSN Dynamic Panel will be performed by RIQI. This panel will evaluate incoming ADTs from Lifespan and add patients to a new EDSN dynamic panel if they meet the following criteria:

- ADT event is an A04 (registration) with a patient type of Emergency
- The patient is over 18 years old
- The ED registration did not originate from Hasbro Children's Hospital

This panel will be used to establish reporting around EDSN volumes and patients will not expire from this panel.

5.1.1   EDSN Push Evaluator

The existing push evaluator will be modified to check incoming ADT transactions for the following criteria before starting the EDSN evaluation process:

- Event is an ADT from Lifespan
- ADT event is an A04 (registration) with a patient type of Emergency
- The patient is over 18 years old

Note: Former requirement around filtering out patients from Hasbro Children's Hospital has been removed due to insufficient ADT data to evaluate location and the patient age filter having the same effect.

5.1.2   Payload Aggregator

A notification evaluation process will be created based on algorithmic recommendations from RIQI's data analytics department. The Payload Aggregator will calculate:

1) Risk of opioid use disorder or opioid overdose
   and/or

8

97   2)   7 and/or 30 day ED visit history

98

99   Included in these calculations will be historical prescription information from the Appriss PDMP

100   database as well as local data stored within the Healthshare HIE such as diagnoses and visit

101   history. The Payload Aggregator process will also trigger these queries and manage the

102   responses from Appriss and the Healthshare Edge Gateways.

103

104   Notifications will be generated when a patient has either a high risk for opioid abuse/overdose

105   or a history of ED visits in the last 30 days. The details on the evaluation model and content of

106   the notification text are TBD as of this writing. If a notification is deemed necessary by this

107   process, the subscription response returned to the Push Evaluator will be affirmative. The

108   content of the MDM alert message will be generated, and the process will proceed with the

109   alert push. If it is not deemed necessary, the subscription response will be negative and the

110   alert process will cease. In either case, the EDSN evaluation will be logged to

111   Custom.RIQI.Class.HS.Audit.EDSN for auditing and reporting purposes.

112

113   5.1.3   Notification Generation and Alert Push to Lifespan/Epic

114

115   If an ED smart notification is deemed necessary by the model, the notification will be

116   generated, placed into an MDM textual transcription message using the patient's demographic

117   and visit data provided in the original triggering message and pushed to Lifespan's Epic

118   environment via MLLP.

119

120   5.1.4   Consumption and Display in Lifespan Epic Environment

121

122   Upon receipt of an ED Smart Notification MDM message from RIQI, Lifespan will consume the

123   message and store the content of the notification as a note attached to the particular patient

124   visit. The method of making this note available to providers is TBD as of this writing.

125

126   5.1.5   Additional Reporting/Auditing Requirements

127

128   Additional auditing will be added in Healthshare for logging the communication and results via

129   Appriss as part of the updated PDMP process, outside the technical scope of the EDSN project.

130   This audit refers specifically to logging a query and response with Appriss as triggered by an

131   automated process and is not related to a specific provider.

132

133   Audit and logging of the EDSN dynamic panel will be managed through the existing RIQI Care

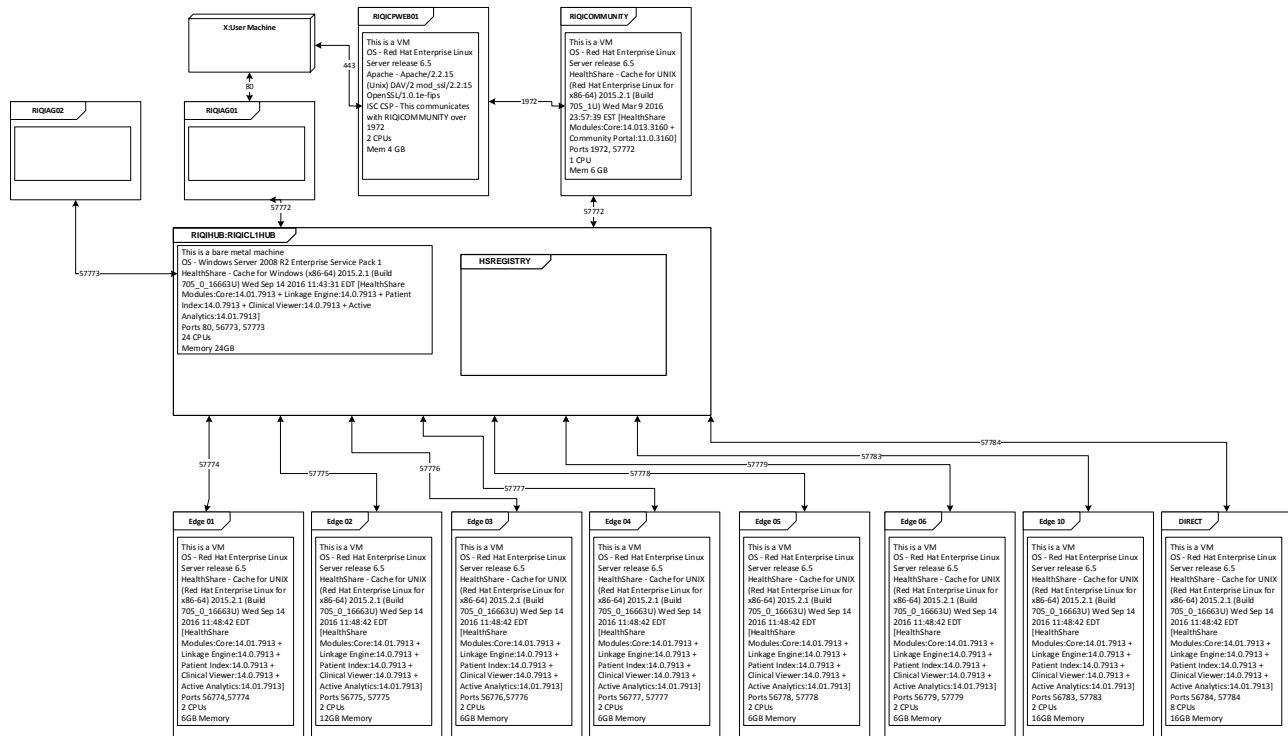134   Management panel audit processes, outside the technical scope of the EDSN project.

135

136   Logging of the EDSN evaluation will be tracked in the new audit class

137   Custom.RIQI.Class.HS.Audit.EDSN, defined above.

138

139

140   # 6. Deployment Diagram

141

142

X:User Machine

RIQICPWEB01
This is a VM
OS - Red Hat Enterprise Linux Server release 6.5
Apache - Apache/2.2.15 (Unix) DAV/2 mod_ssl/2.2.15 OpenSSL/1.0.1e-fips
ISC CSP - This communicates with RIQICOMMUNITY over 1972
2 CPUs
Mem 4 GB

RIQICOMMUNITY
This is a VM
OS - Red Hat Enterprise Linux Server release 6.5
HealthShare - Cache for UNIX (Red Hat Enterprise Linux for x86-64) 2015.2.1 (Build 705_1U) Wed Mar 9 2016 23:57:39 EST [HealthShare Modules:Core:14.013.3160 + Community Portal:11.0.3160]
Ports 1972, 57772
1 CPU
Mem 6 GB

RIQIAG02

RIQIAG01

RIQIHUB:RIQICL1HUB
This is a bare metal machine
OS - Windows Server 2008 R2 Enterprise Service Pack 1
HealthShare - Cache for Windows (x86-64) 2015.2.1 (Build 705_0_16663U) Wed Sep 14 2016 11:43:31 EDT [HealthShare Modules:Core:14.01.7913 + Linkage Engine:14.0.7913 + Patient Index:14.0.7913 + Clinical Viewer:14.0.7913 + Active Analytics:14.01.7913]
Ports 80, 56773, 57773
24 CPUs
Memory 24GB

HSREGISTRY

Edge 01
This is a VM
OS - Red Hat Enterprise Linux Server release 6.5
HealthShare - Cache for UNIX (Red Hat Enterprise Linux for x86-64) 2015.2.1 (Build 705_0_16663U) Wed Sep 14 2016 11:48:42 EDT [HealthShare Modules:Core:14.01.7913 + Linkage Engine:14.0.7913 + Clinical Viewer:14.0.7913 + Active Analytics:14.01.7913]
Ports 56774,57774
2 CPUs
6GB Memory

Edge 02
This is a VM
OS - Red Hat Enterprise Linux Server release 6.5
HealthShare - Cache for UNIX (Red Hat Enterprise Linux for x86-64) 2015.2.1 (Build 705_0_16663U) Wed Sep 14 2016 11:48:42 EDT [HealthShare Modules:Core:14.01.7913 + Patient Index:14.0.7913 + Clinical Viewer:14.0.7913 + Active Analytics:14.01.7913]
Ports 56775, 57775
2 CPUs
12GB Memory

Edge 03
This is a VM
OS - Red Hat Enterprise Linux Server release 6.5
HealthShare - Cache for UNIX (Red Hat Enterprise Linux for x86-64) 2015.2.1 (Build 705_0_16663U) Wed Sep 14 2016 11:48:42 EDT [HealthShare Modules:Core:14.01.7913 + Patient Index:14.0.7913 + Clinical Viewer:14.0.7913 + Active Analytics:14.01.7913]
Ports 56776,57776
2 CPUs
6GB Memory

Edge 04
This is a VM
OS - Red Hat Enterprise Linux Server release 6.5
HealthShare - Cache for UNIX (Red Hat Enterprise Linux for x86-64) 2015.2.1 (Build 705_0_16663U) Wed Sep 14 2016 11:48:42 EDT [HealthShare Modules:Core:14.01.7913 + Patient Index:14.0.7913 + Clinical Viewer:14.0.7913 + Active Analytics:14.01.7913]
Ports 56777,57777
2 CPUs
6GB Memory

Edge 05
This is a VM
OS - Red Hat Enterprise Linux Server release 6.5
HealthShare - Cache for UNIX (Red Hat Enterprise Linux for x86-64) 2015.2.1 (Build 705_0_16663U) Wed Sep 14 2016 11:48:42 EDT [HealthShare Modules:Core:14.01.7913 + Patient Index:14.0.7913 + Clinical Viewer:14.0.7913 + Active Analytics:14.01.7913]
Ports 56778, 57778
2 CPUs
6GB Memory

Edge 06
This is a VM
OS - Red Hat Enterprise Linux Server release 6.5
HealthShare - Cache for UNIX (Red Hat Enterprise Linux for x86-64) 2015.2.1 (Build 705_0_16663U) Wed Sep 14 2016 11:48:42 EDT [HealthShare Modules:Core:14.01.7913 + Linkage Engine:14.0.7913 + Clinical Viewer:14.0.7913 + Active Analytics:14.01.7913]
Ports 56779, 57779
2 CPUs
6GB Memory

Edge 10
This is a VM
OS - Red Hat Enterprise Linux Server release 6.5
HealthShare - Cache for UNIX (Red Hat Enterprise Linux for x86-64) 2015.2.1 (Build 705_0_16663U) Wed Sep 14 2016 11:48:42 EDT [HealthShare Modules:Core:14.01.7913 + Linkage Engine:14.0.7913 + Clinical Viewer:14.0.7913 + Active Analytics:14.01.7913]
Ports 56783, 57783
2 CPUs
16GB Memory

DIRECT
This is a VM
OS - Red Hat Enterprise Linux Server release 6.5
HealthShare - Cache for UNIX (Red Hat Enterprise Linux for x86-64) 2015.2.1 (Build 705_0_16663U) Wed Sep 14 2016 11:48:42 EDT [HealthShare Modules:Core:14.01.7913 + Linkage Engine:14.0.7913 + Clinical Viewer:14.0.7913 + Active Analytics:14.01.7913]
Ports 56784, 57784
8 CPUs
16GB Memory

143   # 7. Technical Dependencies

144   ## 7.1 Appriss

145   RIQI will communicate with Appriss via the Appriss ncPDP web service, an HTTP POST to the PDMP
146   gateway.

147

148   ## 7.2 Risk Model

149   Details of the risk model are not available at this time.

150

151   ## 7.3 Epic Deployment

152   RIQI will receive HL7 ADTs via the current LIFESPAN participation gateway. RIQI will send HL7
153   MDMs back to LIFESPAN via the standard Healthshare Access Gateway. Lifespan will be responsible
154   for the consumption and display of the notification to end users.

155

156 **RIQI APPROVAL**

157   The following RIQI individuals will approve this document.

Organization	Name	Role	Signature	Date
RIQI	Adam Trahan	Architecture and Integration Analyst		
RIQI	Elaine Fontaine	Business Owner		

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